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Miscellaneous Publication No. 1229

Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

This publication is a supplement to Miscellaneous Publication No. 1020,
"A House-Framing System for Low-Cost Construction."

Washington, D.C.

Issued

July 1972

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 10 cents

STOCK NUMBER 0100-2451

How to Build and Install Curtain Walls as Partitions

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The increased use of trusses in house construction has reduced the need for load-bearing partitions. When existing rooms are subdivided, a load-bearing wall is generally not necessary. This makes the use of curtain walls possible. Curtain walls are non-load-bearing and do not support the vertical loads of the roof or upper stories. However, they must resist horizontal loads caused by the occupants' use. USDA research has developed a new method to build and install these curtain walls.

Figure 1 shows the frame of a curtain wall. Construction is rigid and secure. Top and bottom framing members overlap the vertical ends. The intermediate framing members have been inserted horizontally between the vertical ends to insure proper spacing and to support finishing material. When panels over 8 feet in length are used, additional vertical framing is needed to insure sound construction. Figure 2 shows how to use short blocks toe-nailed between the horizontal girts.

Generally, all parts of the frame are made of 2 by 4's nailed together with twelvepenny or sixteenpenny nails (especially when built onsite and a holding jig is not available). A jig will hold the timbers straight and prevent warping, so that nails may be placed more accurately. It will also permit the use of smaller framing and thus reduce the cost of materials for the walls.

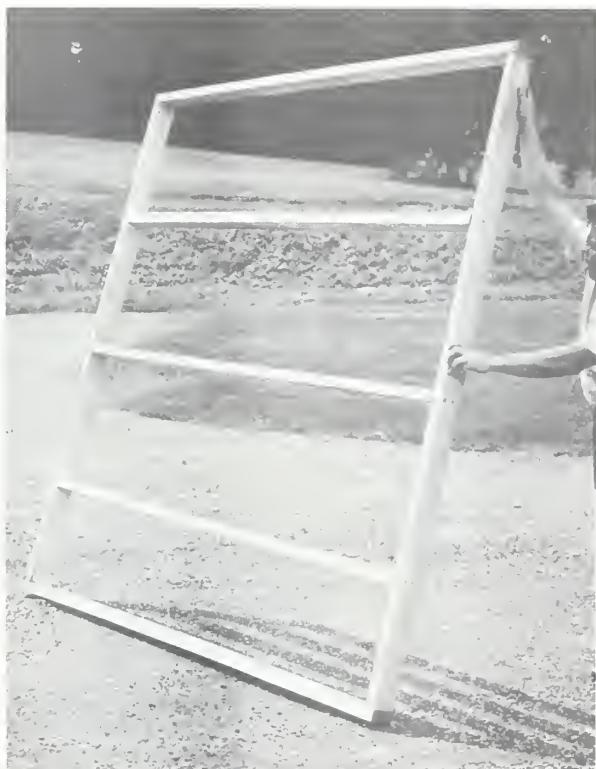
Gluing is also possible when a holding jig is used. This will improve the appearance and rigidity of the panels. Because the partitions do not support any vertical loads, frames built of 1 by 4's or 1 by 3's and securely glued or nailed with eightpenny or tenpenny nails are strong enough for this light-frame construction.

Determining the proper panel height is one problem when curtain-wall partitions are used. Full-height partitions are difficult to tilt into place; excessively short ones (fig. 3) require more blocking and are difficult to fasten securely. Panels cut one-fourth inch shorter than the ceiling height allow sufficient clearance to tilt the partition into place (fig. 4).

Curtain walls can be blocked up from the floor or down from the ceiling. Blocking from the ceiling, however, has not proved satisfactory. Most

modern ceilings are composed of soft materials with very limited structural strength. The concentrated load that blocking places on the ceiling (fig. 5) will generally cause the materials to warp or dent, especially when there is no ceiling joists or truss to back up the ceiling. Also, the ceiling trim or molding is difficult to fasten in place (fig. 6), because the top framing member is so far from the ceiling. The baseboard must be nailed very close to the floor, below its centerline (fig. 7), because the 2 by 4 at the bottom of the curtain wall is very close to the floor. The top of the base may now warp away from the wall.

All of these difficulties can be largely overcome



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Figure 1.—Prefabricated framework for curtain-wall partition.

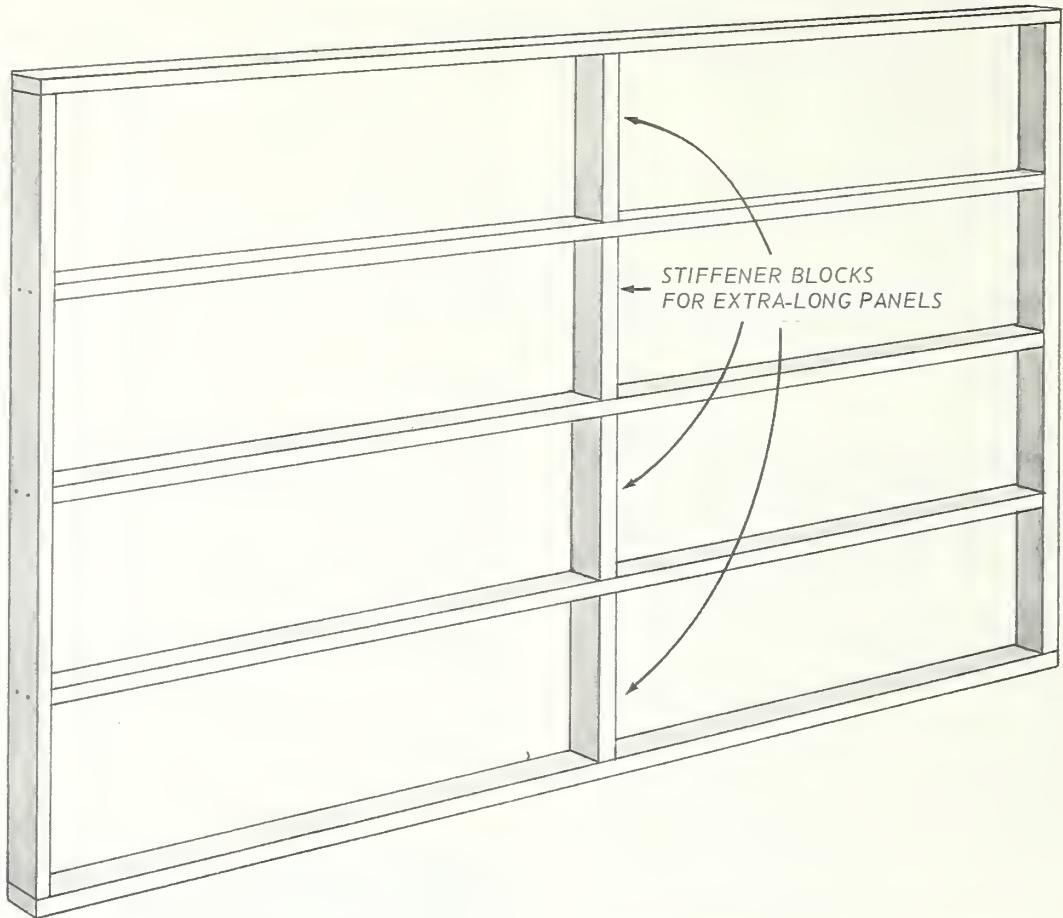


Figure 2.—Sketch of prefabricated framework for walls over 8 feet long showing vertical inserts.

by blocking upward from the floor (fig. 8). The floor and subflooring provide a secure support for the concentrated load created by the blocking. Then the long flat top of the panel presses evenly and lightly over a large area, thus preventing warpage of the ceiling (fig. 9). With the top of the panel flat against the ceiling, a narrow molding can be nailed directly to the top of framing member (fig. 10). The bottom of the panel is raised slightly off the floor, thus providing a better support for a baseboard.

Curtain-wall partitions can be effectively and attractively installed in houses or rooms where there is no need to support vertical loads. Through this procedure, the wall covering can be applied before installing the partitions. The partition is movable and may be used either in other rooms within the same house or in another house with approximately the same ceiling height. Curtain-wall partitions also have the advantage of allowing all the ceilings to be installed before the partitions, thereby eliminating considerable cutting and fitting which is necessary when each ceiling is emplaced individually.

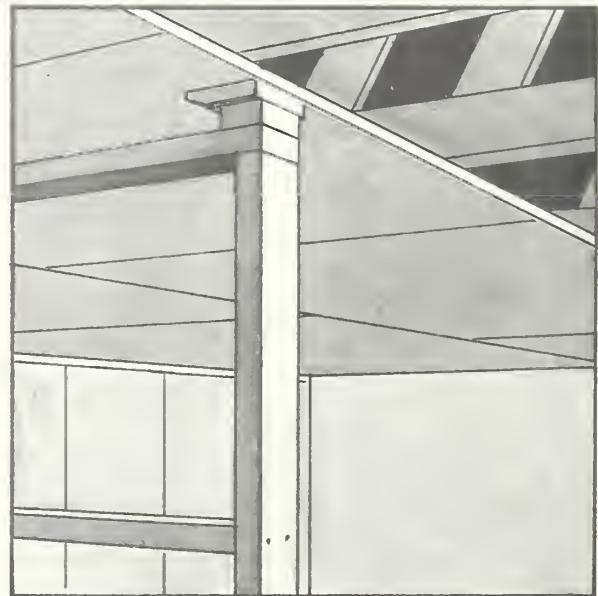


Figure 3.—When curtain walls are too short, they are difficult to block and fasten into place.



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Figure 4.—Photograph of curtain-wall frame being tilted into place. (This frame is one-fourth inch shorter than ceiling height.)

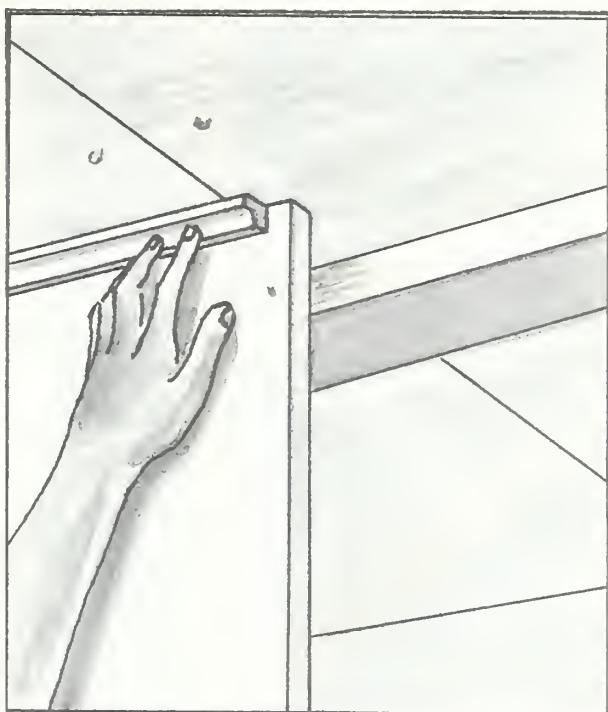


Figure 6.—Curtain-wall partition is blocked away from the ceiling with no solid timber close to the ceiling for fastening of moldings.



Figure 5.—Dry-wall ceiling was warped by wedge placed between curtain-wall partition and ceiling.

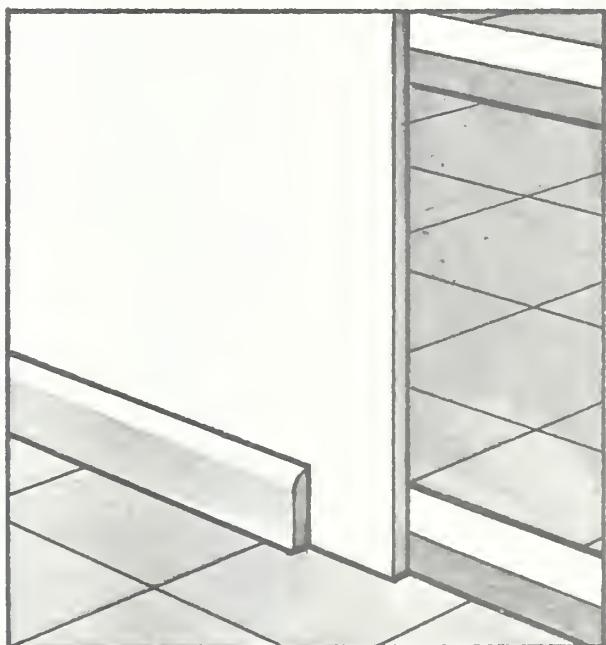


Figure 7.—Timber at the bottom of the curtain wall is very close to the floor. This requires baseboard to be nailed below its centerline.

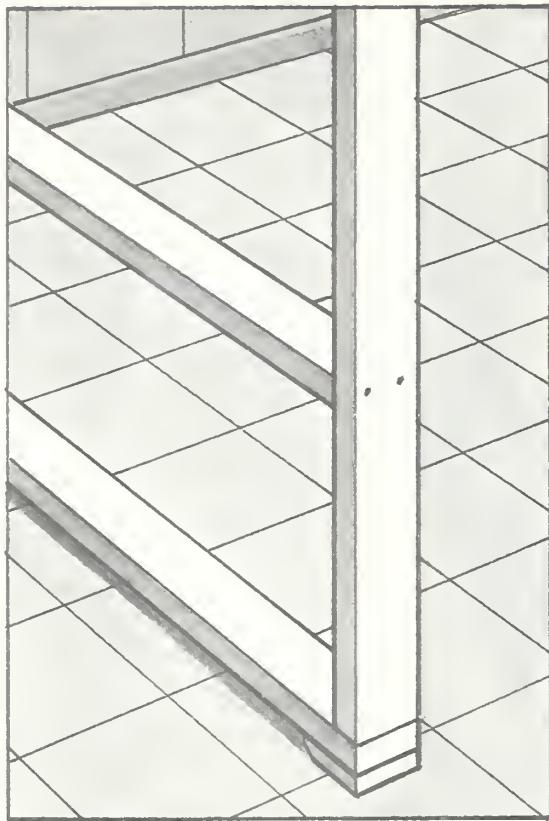


Figure 8.—Curtain-wall partitions blocked away from the floor provide several advantages over partitions blocked away from the ceiling.

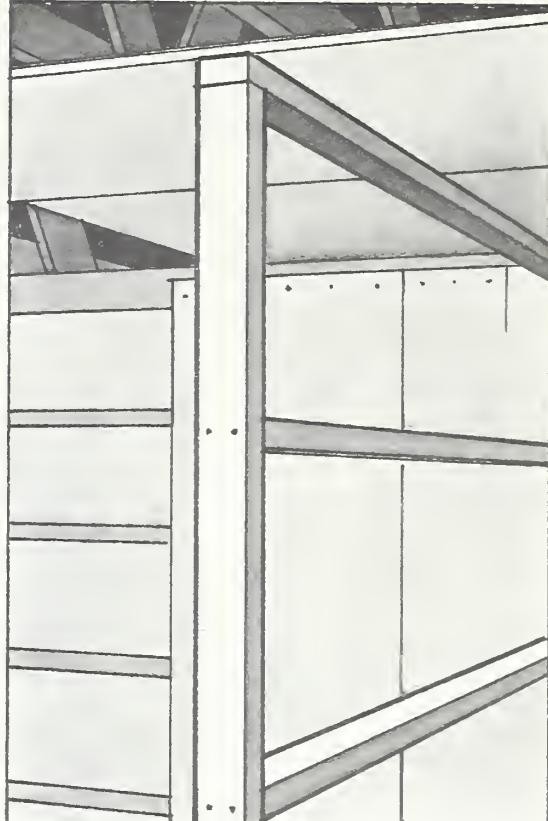


Figure 9.—Curtain-wall partition blocked away from floor has a large bearing surface to distribute pressure evenly over a large ceiling area.

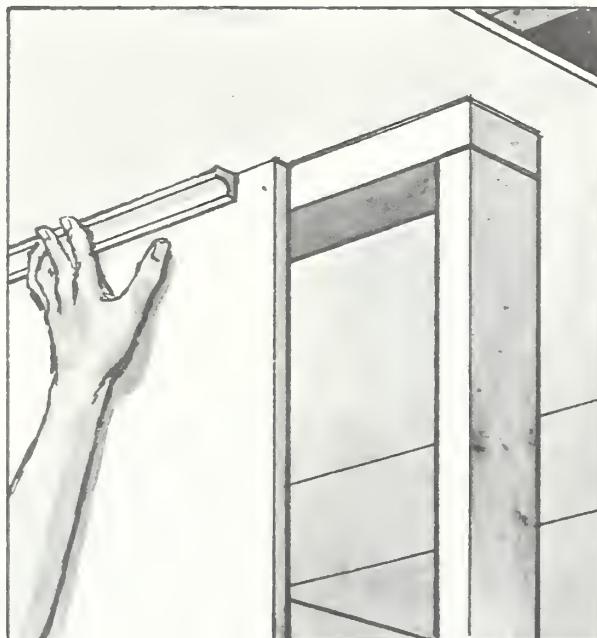


Figure 10.—Small moldings are easily fastened to the top plate of a curtain-wall partition when partition is blocked up from the floor.



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